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Optical absorption and refractive index study of Ti: al2O3 single crystal

Abstract

The optical absorption of Ti:Al2O3 single crystal has been measured at room temperature, in the wavelength region between 200 nm and 800 nm. The main absorption peaks at 491 nm and 562 nm, the weak infrared absorption band with a peak at 650 nm and the strong UV absorption band below 300 nm were observed. The refractive index is discussed by using Fresnel's equation. In particular, the Sellmeier equation was determined in the visible region by means on non-conventional method based on the measurement of refraction by using UV-visible spectroscopy. The refractive indices decreased from3.71 to 1.28 with wavelength in the range 400 - 800 nm.